OFFICIAL JOURNAL OF
THE MUSHROOM GROWERS'
ASSOCIATION

# MGA BULLETIN

FEBRUARY, 1953 · NUMBER 38

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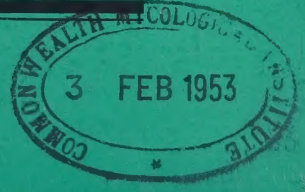

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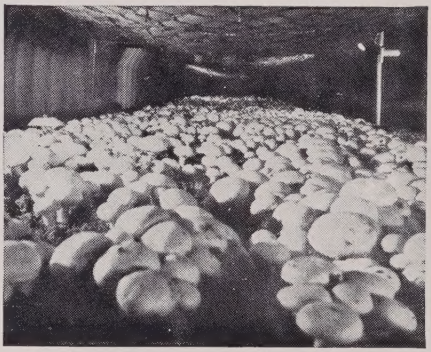

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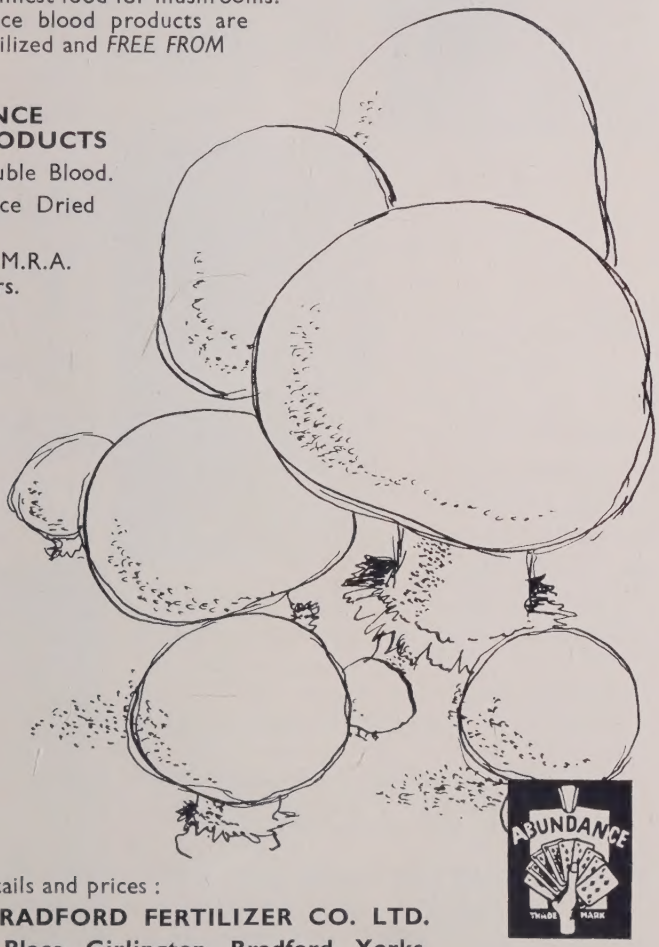


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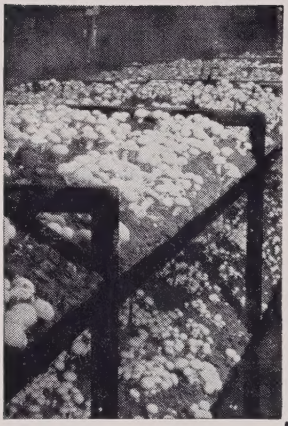

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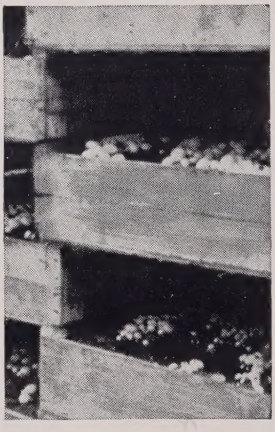

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The
**MGA BULLETIN**

**FEBRUARY 1953**
**NUMBER 38**

**EDITORIAL:**

# SYNTHETIC CASING

After I had broadcast a few words on 14th December on the difficulties facing amateurs when they tried to grow mushrooms in the garden I rather expected some grumbling over "encouraging competition" and "giving away our secrets."

Instead I have had a great many letters and phone calls asking what I meant when I said, in a final sentence directed at the commercial grower, that 1953 might see the advent of a synthetic casing material based on peat and silicates.

I now realise why scientists in general are so cautious in making pronouncements of this nature, for I have been unable to reply satisfactorily to any of these inquiries.

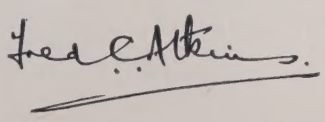
We all know that peat may be useful when mixed with certain soils. Dr. Bewley had some very interesting results with it before the Second World War, and Dr. Stoller in the December Bulletin went into the matter more fully.

By "silicates" I meant Vermiculite, hesitating to use that word in case it was a proprietory name.

The Yaxley Research Station is in the midst of exhaustive tests with various mixtures of peat, Vermiculite and *two other essential ingredients* which I shall not reveal because (a) I have not the authority of the MRA Directorate to do so; (b) the experiments are not complete; (c) even Dr. Edwards is not yet in a position to say which mixture is best on an experimental scale; (d) no commercial-scale results are known; and (e) this is to be the focal point of interest at the Research Station's Open Day in April.

What a blessing it will be if we really find we can synthesize a casing material which will give results as good as soil. With freedom from casing-borne diseases, and a synthetic compost, we shall be able at last to get down to scientific growing. Of course, we shall need to compost in a controlled environment, to air-condition our cropping houses, and . . . . . .

But limitations of space restrain me.



## CALIFORNIA RESEARCH

**Robert G. Colodny,** of West Foods, Soquel, California, has written for the Bulletin the following note in reply to a request for details of the new West Foods research on mushrooms:

"At the present time, we are concentrating our attention on the complex problem of supplements for the standard manure compost. We have undertaken experiments to test the value of the addition of the Vitamin B Complex and of protein and carbohydrates. We have used powdered skim milk for protein and carbohydrates, as this material runs 37% protein, 53% lactose and 8% minerals. It is applied at the rate of one pound per hundred square feet over a six week period. We anticipate good results from this, but are suspending our judgment until after several runs.

"Considering what is known of the metabolism of *Agaricus campestris*, we are going to test the value of adding amino acids rather than whole protein. These experiments involve rather large areas and, hence, should be more reliable than the flask or petri dish methods. We also anticipate some extensive experiments with antibiotics, both as a growth stimulant and as a control for competitors.

"We will be pleased to pass on the results of this work at a later date."

## THOSE VISITORS!

Capt. Giles Tweedie's letter in the August number is brief and to the point. We must prevent these **inquisitive bodies,** as he calls them, from bothering us. A visitor who cannot talk mushrooms is a bore to a mushroom grower. We growers may sometimes be accused of one-track-mindedness, but it takes a very deep, sound track to cope with all the problems facing growers these days. The visitor I like best is the one who is not afraid to admit his own failures and difficulties, but the chap who always gets 3 lb. to the square foot without any trouble has not much in common with me. I often wonder if square feet vary in size. In any case the " 3 lb." man (if he is genuine) has obviously never been up against the very problems that I am always wanting to discuss. My advice to anyone visiting another mushroom grower's premises, is to be frank and open about everything. Applaud your host's practices where you approve of them, but don't be afraid to tell him if you see anything with which you don't agree. He will thank you for it later if he proves you right. As a general rule the more experienced a mushroom grower is the less confident he seems to get, so don't hold back just because he has had many more years of experience than you have had. Also remember that in five minutes your host will be able to tell whether you are a novice, or an experienced grower. If you are the former do not detain him too long if you want to be invited back. Above all, remember that mushroom growers are very busy men and just haven't time for variety entertainment. **ROBERT PATTERSON.**

# SUCCESSFUL TAX APPEAL

An MGA member recently bought about £400 worth of timber to replace rotted bedboards. He made boxes with it and claimed the purchase value of the timber as an expense.

Replacement of rotted bedboards is allowed against profits, but the local Inspector of Taxes appears to have been unaware of the identical function served by boxes (viz., to contain the compost), and the sum involved was disallowed, " wholly or in part," under the provisions of Section 137 (d), (f) or (g) of the Income Tax Act, 1952.

The Inland Revenue argued that (a) the installation of boxes for propagation purposes was a new departure, and therefore there was a taxable " improvement " ; or (b) the boxes came under the heading of Utensils and should be treated as additions to the utensils already carried.

The member brought the matter to the notice of the MGA and, as an important principle was involved, it was discussed by the Executive Committee. The legal department of the NFU was consulted, as a result of which the following argument was put to the Commissioners of Inland Revenue : (a) The production process must be considered in its entirety, i.e. the replacement of one part performed exactly the same function as was allowable for Income Tax purposes in the case of Samuel Jones and Co., Ltd., v. C.I.R., where a complete chimney was replaced, " being physically, commercially and functionally an inseparable part of the factory." (b) There was no inherent improvement in the mushroom " factory " by the replacement of one container by another—boxes or shelving being an integral part of the process of growing mushrooms. Neither boxes nor bedboard were fixtures and in his case there was no advantage in boxes over bedboards.

**The Commissioners found that the whole sum should be allowed as a charge against our Member's profits.**

The member concerned has written to thank the MGA and the NFU for their assistance and says : " *This is just one more instance of the necessity for the existence of the Mushroom Growers' Association.*"

---

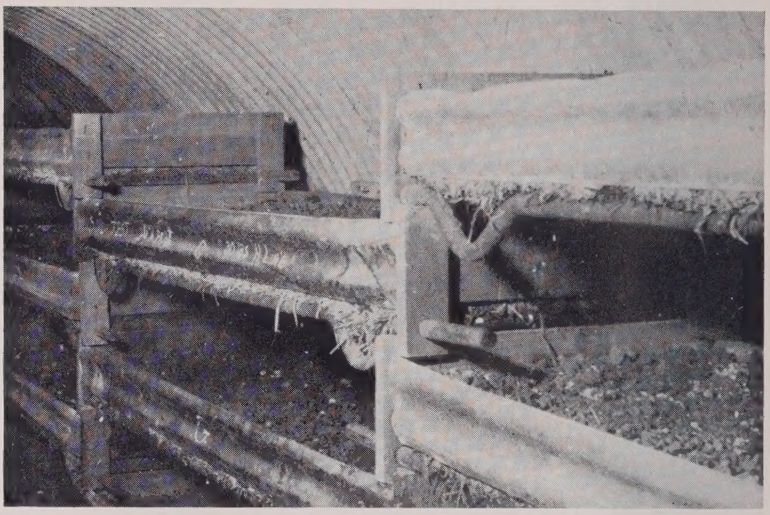
## NEW (DECEMBER) MGA MEMBERS

COLODNY, R. G., P.O. Box 447, Soquel, California, U.S.A.
*DERKS, G.*, " Gelderland," Champignonbedrijf, Overasselt, Holland.
*DRING J. Ltd.*, The Airport, Portsmouth, Hants.
KNAUST, Henry, West Camp, New York, U.S.A.
KNAUST, Henry Jr., Knaust Mushrooms Inc., Vallmeyer, Illinois, U.S.A.
O'BRIEN, D. J., O'Brien's Nurseries, Cloyne, Co. Cork, Eire.
PARMENTIER, J., 70 Route des Acacias, Geneva, Switzerland.
PATERSON, Cheyne, 18 Great Stuart Street, Edinburgh, 3.

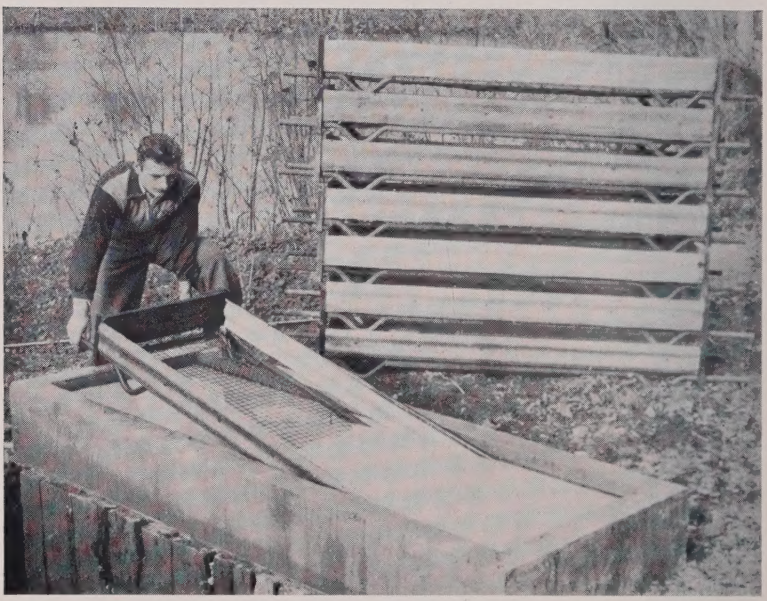
### CHANGES OF ADDRESS

HOPKINS, R. J., Hammer Lane Farm, Vines Cross, Horam, Sussex.
HULLEY, P., Orkney Farm, P.O. Box 455, Umtali, S. Rhodesia.
*MANEY, W. S. & Son Ltd.*, Russell Street, Park Row, Leeds, Yorks.
*SUTHERLAND, Major G. A. B.*, c/o Lloyds Bank, Cox & Kings Branch, 6 Pall Mall, S.W.1.
*TAYLOR, Dr. R. E.*, The Homestead, Pebworth, Stratford-on-Avon, Warcs.
VENOUR, Lt. Col. W. A., D.S.O., Hom Lodge, Hom Green, Ross-on-Wye, Herefordshire.
WINTER, Ch. De., Turnhoutse baan 207 à Wijnegem, Belgium.

(*Italics indicate Honorary Membership*)



Mr. Dalton's trays in cropping formation (*above*)
and being sterilized between crops (*below*)



# BIGGER TRAYS DO BETTER

*says* **D. N. DALTON**

A rather insanitary underground bakehouse was the scene of my first attempt at mushroom growing. Using rough and ready shelves, the first crop was successful, apart from fly. Encouraged, I pressed on with further crops which became less and less, ending in complete failure. In spite of the liberal use of emulsified cresylic acid, it seemed that I had come up against ' site contamination.'

I therefore decided that, in any commercial venture into mushrooms, such a possibility should be eliminated. I would use a metal house if possible, with a concrete floor, and nothing should remain inside to carry over disease after emptying. That meant trays in some form.

I could not (and still cannot) raise much enthusiasm for a lot of grubby fish boxes, nor could I afford the proper trays. The carry-over danger prompted me to look for something in metal, preferably with a wire base as earlier experiments had shown cropping was earlier and better where there were gaps in the bottom of the shelves.

Then I realised I already had the very things—ex-C.D. metal stretchers which had been acquired, with some difficulty, for other purposes. These were easily converted into trays by fitting wooden ends and filling in the sides with Nissen joints (corrugated strips 6′ by 6″) which fit exactly and cost only a few pence each. The resulting product was a very strong light tray, giving an area of 12 sq. ft. and costing under 5/-.

Having now given these trays a good trial, I have found no snags—in fact, **they seem ideally suited for the job.** Although weighing about 2 cwt. when filled and cased, they are easily handled by two men—being designed for carrying. They stack well, both close and in the cropping position. It will be noted that in the latter they interlock and, which is a great advantage, they allow plenty of space for picking and trashing. In addition a good air circulation is possible, emptying is simple, and they can be sterilised by dipping.

I was apprehensive at first about the wire-mesh bottoms, but now I think they will last a considerable time. I have had these stretchers for two years stored in the open and in 18 months of use have only had to replace the wire in one tray. I have a few spare wires and when these are gone I shall resort to the heavy gauge galvanised netting used for making the floors of turkey-fattening cages.

It should not be inferred that I am joining issue in the rather futile argument of *Trays v. Shelves.* I merely sing the praises of these adapted stretchers for mushroom growing. **So far, an average of 2½ lb. per sq. ft. has been obtained from a 5″ depth of compost** in 12 weeks' picking which, to say the least, is encouraging to a beginner.

Further supplies of these useful maids-of-all-work now seem unobtainable, and I have to resort to dismantling gates, chicken houses, pig pens, fences, apple racks, poultry carriers, etc., to obtain enough for another mushroom house!

# MORE ABOUT VENTILATION

*By* **Dr. R. L. EDWARDS**

In a recent article on the ventilation of fruit and vegetable stores, G. Mann (1) compares systems of natural and forced ventilation of farm buildings used for storage.

In one of these, commonly used in mushroom houses, there are inlet vents at floor level, and an outlet in the roof. He suggests that it is preferable to have only one outlet; if there are several, when the wind is in some directions there may be a difference of pressure between two of them, and air will enter by one and leave by the other, short-circuiting the longer path from the floor inlets to the roof.

An alternative to this system, giving more positive ventilation without fans, is to have two rotating cowls, an inlet with a fin which always brings it facing the wind, and the other with a fin which makes it back the wind, providing the outlet.

The inlet should be connected to a duct carrying the incoming air down to floor level, and the two should be at or near opposite ends of the building. In this way the through current of air will also induce general circulation inside the building. This can be improved by fitting a long inlet duct with delivery branches, but that is not usual in mushroom houses.

Shutters on ventilators of this kind can be controlled by thermostats if desired.

Forced ventilation by fan is the easiest to control and is independent of wind and temperature effects.

An inlet fan at ground level is the more positive, but it is difficult to avoid draught. Extractor fans cause less draught, but it is necessary to have a good inlet vent at the opposite end of the building to promote general circulation; air is liable to leak in through cracks near the fan and go straight out again, leaving more or less stagnant air in the rest of the house, particularly if a wind is blowing directly on to the end of the house where the fan is installed.

(1) G. Mann, 1952, Agriculture, **59**, 335.

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## CORRESPONDENCE

It has occurred to the writer that some of your members would be interested in the large area of **limestone caverns** which we have on one of our properties just outside Birmingham. The main point about these caverns is that they are reasonably dry and maintain a very even temperature, there is full access for road vehicles, electric lighting is available, and they are almost unlimited in extent. I should be grateful if you would ask any of your members who are interested to write to me personally, when I shall be pleased to give them further particulars and to arrange for them to inspect. It is my desire to make arrangements to let off the whole or portions of the caverns for suitable purposes.

C. W. NOAKE, Managing Director, Potclay Ltd., Wharf House, Copeland Street, Stoke-on-Trent, Staffs.

# SPENT MUSHROOM COMPOST AS A MANURE

*By* **P. B. FLEGG, B.Sc., A.R.I.C.**

Much information on the composition of spent horse-manure and synthetic composts, in terms of the major plant nutrients, has been collected during experimental work at Yaxley. As Dr. Edwards stated at the last Annual Meeting of the MGA, it is hoped that cropping trials will be made in the near future at Ministry Horticultural Experimental Stations.

In order to estimate the manurial value of spent compost several factors must be examined. Yield and length of cropping time generally have no great effect on the final manurial value of the compost. The main effect of a high yield and long cropping period is to reduce the amount of spent compost to be disposed of. The length of composting time was found, with synthetic composts, to have little effect on the nitrogen content of the spent compost. With increased length of composting period the nitrogen content was slightly higher.

*The source of nitrogen* used in synthetic composts made a considerable difference. It was found that of several materials used, dried blood (MRA Activator) produced spent composts with the highest nitrogen content. Using urea the nitrogen content was much lower; the initial nitrogen content of the composts was the same.

*The presence of soil* in spent compost, often held to be a disadvantage, must now be examined. Measurements on beds cased with $1\frac{1}{4}''$ clay subsoil and 6″ depth of compost at the end of cropping show that the ratio by weight of dry soil to compost is approximately 1 : 1. The manurial value of the soil is practically nil but it is usually well limed. A clay type soil, often a subsoil, is considered most suitable for casing. Thus a 1 : 1 mixture of clay and compost would make a useful addition to a light sandy soil or a soil poor in organic matter, improving texture and increasing drought-resisting properties of the soil. Applied to a clay soil the addition of more clay, well limed, will make little or no difference and the compost will help to open up the clay, improving drainage, aeration and nutrient status.

To assess the horticultural value of spent composts comparison has been made with farmyard manure. All of these materials are variable but the Table shows typical values for nitrogen, phosphoric acid and potash content. It is most likely that spent compost will be available with casing soil included. Spent horse-manure compost, with soil, is in general not quite as good as farmyard manure but spent MRA synthetic with soil is better than farmyard manure except in potash. The potash content of all these materials is variable because it is more likely to be leached out by water, and the final potash content will depend largely upon the treatment of the material.

From this brief discussion it is apparent that **both synthetic and horse-manure spent compost have a definite manurial material value and that spent synthetic compost compares favourably with farmyard manure.**

When discussing the use of spent mushroom compost as a manure *the problem of disease* must be mentioned. The diseases of the mushrooms which are often present in spent compost are not those which attack crop plants. There is no greater risk of introducing disease to green plants from spent compost than from farmyard manure. The danger from disease is to the mushroom grower; spent compost should not be dumped near growing houses, soil shed, etc. Care should also be taken to ensure that spent compost is not carried in the same vehicles as are used for fresh straw, manure or soil.

| | N | $P_2O_5$ | $K_2O$ |
|---|---|---|---|
| | lb. per wet ton | | |
| Farmyard manure .... .... .... .... | 12 | 5 | 12 |
| Spent horse-manure compost (excluding soil) | 17·5 | 6 | 20 |
| Spent horse-manure compost (including soil) | 8·8 | 3 | 10 |
| Spent MRA synthetic compost (excluding soil) | 26·5 | 13 | 9 |
| Spent MRA synthetic compost (including soil) | 13·2 | 7·5 | 4·5 |

## MRA COMPOST

One out of every five growers who replied to the Research Questionnaire (enclosed with the December Bulletin) asked for information about MRA Synthetic Compost. Full details have already been published, in MRA Reports for 1949 and 1951, price 5/-.

## SPENT COMPOST FOR SALE?

If growers with supplies of spent mushroom compost for sale will write to Mr. B. Easy, the Soil Association, 8F Hyde Park Mansions, London, N.W.1, stating quantity, when available, and price, he may be able to put them in touch with purchasers among the members of the Soil Association. Unfortified horse-manure would be preferred to boosted or synthetic compost!

## MUSHROOM SHELTERS

Wardle, near Rochdale, Urban Council has asked the Home Office to approve a suggestion that air-raid shelters should be used for growing mushrooms. *Manchester Evening Chronicle*—24.11.52.

## BANISH FLIES

**N. W. Fell** sends us a letter which appeared in a Tasmania newspaper written by J. Fred. Johnson: "American scientists must be a slow lot not to have discovered a method to banish flies from milking sheds. I discovered a way more than 40 years ago. Get a tin scoop or a gardener's trowel. Throw hard against the ceiling a trowel-ful of air-slacked lime. Do this each morning when the shed is being cleaned out. An invisible film of lime is always falling, and there will be no flies in the shed. The method also keeps flies from my stable."

**Our Secretary** received so many Christmas Cards that he asks to be excused from acknowledging them individually. All were very much appreciated.

# Volatile Substances Affecting Growth

## Dr. STOLLER ANSWERS SOME QUESTIONS

**Member E. PALFREY wrote to the Editor:**

I found Dr. Stoller's article in the October Bulletin, 1952, very interesting but I am not very clear about some points. Assuming the existence of the hypothetical substance (say X), does he believe abnormal growth may be due to X or $CO_2$ or both. It seems that, since the mycelium gives out $CO_2$ and X when growing, any conclusions reached concerning the concentration of $CO_2$ and abnormal growth must be confounded with the possibility of abnormal growth being due to X, unless an experiment can be devised for removing X and leaving the $CO_2$.

Two ideas occur to me, both concerning Lambert's experiments. First, the effect of $CO_2$ in inhibiting growth may be due to the lower proportion of $O_2$ which results from the addition of $CO_2$. One could use forced ventilation of $O_2$ and $N_2$ at different proportions to test this idea.

Secondly, noting that increased ventilation tends to prevent abnormalities, which in itself suggests that the heavy gas X is being swept away, a sufficiently forced ventilation by air at various $CO_2$ concentrations would test whether $CO_2$ itself inhibits growth; Lambert did not suspect the presence of X and he may have passed his $CO_2$ laden air more slowly as the $CO_2$ content increased.

Some other points which arise are the possibility of freezing X, using $CO_2$ snow, since Stoller believes it to have a high melting point compared to $CO_2$, and examining the liquid; and why did he omit using a column of earth as a filter; and why did he omit passing air at different speeds (he may have found that all washing removed X, but that washing slowed the passage of air so that X was not being swept out).

Finally, an idea: Normally growing fungi which live in earth receive $O_2$ by a passage of $O_2$ downwards into the earth: why not try ventilating the earthenware pots by drawing air out from the bottom of the pot, using the bell jars to prevent cross current of air? If X is absorbed by earth, then it will be eliminated.

**Dr. B. B. Stoller has replied as follows:**

It was shown conclusively in my article in MGA Bull 34 that the stems of mushrooms will elongate and the caps be retarded in the complete absence of carbon dioxide. So it was assumed that an unknown volatile substance produced this effect on mushrooms, instead of carbon dioxide. I did not attempt to refute Dr. E. B. Lambert's claim that carbon dioxide will cause the stems to elongate and retard the caps. However, a detailed review of Lambert's publication of 1933 seems to be required, in order to clarify the effect of $CO_2$.

Lambert claims to have demonstrated experimentally that this abnormal growth (elongation of stem, etc.) is due to the injurious effects

of $CO_2$ released during respiration of sporophores. My evaluation of his data reveals, however, that there is a slight, if any, elongation of the stem when 0·2 to 2·6% $CO_2$ introduced under the bell jars is derived from commercial cylinders; whereas severe abnormal growth occurs if the gases (1·8% $CO_2$) accumulate naturally from respiration (see his Fig. 5; compare diagrams A to F and G). In other words, Lambert made no distinction regarding the source of $CO_2$ he employed; whether the $CO_2$ was derived from commercial cylinders or accumulate naturally under the bell jar was not taken into account.

In 1936 I called Lambert's attention to this discrepancy; he acknowledged this difference, but suggested it might be due to the greater susceptibility to $CO_2$ of mushrooms from older beds. But I have observed the same effect of $CO_2$ from respiration on both old and new mushroom beds, so it seems Lambert's explanation is not valid.

Lambert also showed in his experiments that growth of mushrooms was stunted or killed by introducing under the bell jars 6% to 20% $CO_2$; but at such high concentrations many gases will kill mushrooms. The point stressed here is that 0·2 to 2·6% $CO_2$ will have practically no effect on the growth of mushrooms when the $CO_2$ is derived from commercial cylinders. The reason for low percentages of $CO_2$, which accumulates naturally inducing abnormal growth, is not on account of the $CO_2$, but is due to some unknown substance mixed together with this $CO_2$.

The basis for this assertion is twofold: (1) It has been shown experimentally in my article that abnormal growth can occur in the complete absence of $CO_2$; (2) $CO_2$ introduced from commercial cylinders in Lambert's experiments has practically no effect on mushroom growth in the low $CO_2$ range. To establish this conclusion beyond doubt, Lambert's experiments with $CO_2$ delivered from commercial cylinders should be repeated.

**AIR-WASHING**

It seems Mr. Palfrey does not realize that the experiments I carried out on air-washing were done in 1944-1945 at the University of Wisconsin (as I noted by reference cited), and that I have not done further experiments in this direction since then. I did not use a column of soil as a filter, as I suggested should have been done, because I did not think of this possibility at the time the experiments were being conducted. I had all I could do during that year to perfect the procedure and mechanism for conducting the experiments. Then I had the baffling problem of mycelium overgrowing the soil and no mushrooms forming, which was contrary to Mader's results. In that case, the first thing one jumps upon is faults in the procedure; a good deal of time was spent in searching for flaws.

Mr. Palfrey is mistaken in his statement that I did not report experiments on rate of air current. See Page 294 of the MGA Bulletin. I reported this experiment briefly since I did not have the opportunity to repeat it. Mr. Palfrey's suggestion for filtering the air through the casing soil in the pots by drawing the air out through the hole in the

bottom of the pot, would not work in practice. Even thin air, like everything else, seeks out the path of least resistance. The air would by-pass the soil by seeping through the junction of the side of the pot and soil, or channel through a thin spot in the soil. For these reasons, the rather complicated procedure was adopted for filtering the air through the soil as described in my article.

Finally, Mr. Palfrey's suggestion for using dry ice to condense the unknown volatile substance is very good. In fact, I have used a procedure of this kind in the attempt to isolate a supposedly volatile substance emanating from bean sprouts; (no substance was isolated). The air-tight room and other equipment required is rather expensive. But until experiments of this kind are performed, it will not be possible to identify, confirm, or deny the nature of this substance.

## VOLATILE SUBSTANCE

I might add, however, that it is not at all certain that this substance is volatile. It might be an extracellular enzyme which reacts at the point of contact of the soil, air, and mycelium. But such enzymes are known to form secondary products from substances in the soil or otherwise, which could very easily be volatile. On the other hand, I have come across some further evidence that this substance may be volatile. In searching my notes for a paper on trace elements, I came across an experiment I carried out in 1940, in which young potted plants of tomato and potato were inserted under bell jars on beds where mushrooms were growing. The tomato plants showed signs of " epinasty " or bending-down of the stems within 24 hours, and at the end of 4 days the stems drooped over so that some were even severed from the stalk. The same effect was observed when the tomato plants were inserted into 3-gallon bottles of spawn (no casing or mushrooms). The potato plants did not respond.

Now this drooping of the stems of the tomato plant, or " epinasty," is well-known to be produced by volatile hormones and unsaturated gases (such as ethylene); in fact, this method is used for assay of plant hormones. So here is further evidence that a volatile substance may be diffusing from the mushroom mycelium. According to my experiments with the enzymes of the mushroom mycelium in agar-culture procedures, I am inclined to believe that this substance is in the nature of an activated peroxide or a *quinone*, rather than the usual type of plant hormone.

Well, such are the possibilities; the only way to decide the issues is by experimentation.

## SECOND INTERNATIONAL CONFERENCE

The Second International Conference on the Biology and Cultivation of Mushrooms will be held in Belgium from 16th to 24th June, at the Institut Agronomique de l'Etat at Gembloux, about 35 miles from Brussels. Further details will be announced later.

# A QUESTION OF PRESERVATION

*By* **M. C. LUXMOORE**

An aspect of mushroom growing which continues to bewilder the grower, and has become acute now that Red Cedar is virtually unobtainable, is the preservation of woodwork, whether shelves or trays. Owing to the necessity of conserving space, I propose to limit this article to one preservative only, namely **creosote.**

As a preservative of wood under even the most adverse conditions, such as are prevalent in mushroom houses, there seems little doubt that creosote is highly efficient. There is, however, a wide divergence of opinion over whether there are consequent ill effects to the crop itself.

It was supposed that this rather curious state of affairs could be accounted for by the different types of creosote used. Some could produce harmful results, whilst others were considered safe. At a casual glance this explanation seemed feasible; all that was necessary was a careful choice of the right brand. After some experience *I consider this solution to be wrong.*

The next suggestion was that any form of creosote, when used on the kinds of wood now obtainable, could damage the crop, owing to the inability of unseasoned wood to retain it. The wood might in fact suck creosote up, and then in time expel it again in small quantities, owing to the presence of sap in the heart of the wood. This is so ingenious an explanation that I hesitate to quarrel with it, but *I believe it to be only half true.*

My contention is that woodwork dipped or sprayed with creosote, or painted with creosote or a mixture of creosote and petrol, **is injurious to mushrooms in some degree so long as fumes are still being released.** If the injury is slight it may well be compensated for by the complete preservation of the wood.

No doubt treated wood left to weather over a period of some months is harmless enough, but in these days when emphasis is all on a quick turn-round, this would seem impracticable.

There are two factors which in themselves are most misleading. The first is that the spawn appears to suffer no ill effect, and in fact grows right up to the sideboards. There also appears to be no check to the spawn growth when it continues into the soil. The second is that one very quickly becomes immune to the smell of creosote fumes.

The senses of the nose become dulled when one is constantly in contact with creosote, but an outsider smells it at once. This is a medical fact.

The combination of these two factors is most baffling. Let us take a hypothetical case. A grower uses creosote as a timber preservative. He realises fumes are being given off at filling, but is sure they will disappear. By the time he is ready to spawn the smell seems to him to be vanishing. The spawn runs well; this is proof to him that all is correct, and that his nose has not played him false. The spawn runs to the boards; he is now even more reassured. And when it runs safely into the soil, surely no further proof is necessary?

**Only at this moment do signs appear which indicate that all is not well.** The probability is that he has dismissed creosote from his mind some time ago. But let him invite an acquaintance in and ask him if he smells anything. The grower's eyes are in fact at this juncture a far better judge than his nose. Can thousands of glittering crystals be seen clinging to the woodwork? If so, they are an indication that fumes may also be present.

The first flush is slow in appearing. Pin-heads form but refuse to mature; eventually they "damp off" and die. Those that *do* grow are often split, aping the bishop in chess. If the grower is also a smoker, he may feel a catch at the back of the throat as he inhales.

According to the seriousness of the attack, so the suspension of growth. Ultimately large mushrooms do appear, frequently malformed, and in bad cases the skin of the cap is discoloured and will flake off, a second clean skin having formed beneath. In really bad cases this scale is brown in colour, and when the mushroom grows larger, it has the appearance of a speckled egg. The freaks that appear are disheartening in the extreme.

**It is a mistake to think that all is lost.** The mushrooms in the long run come normally; waiting for them is the worst part of the adventure. I don't mean to imply that there is only loss of time, but results may still prove satisfactory.

Ventilate as much as you dare, and a little more. Remove crystals in case they fall on to the bed below. Wash down all exposed woodwork with a solution of ferrous sulphate and water which 'fixes' the creosote and prevents further fumes, save for those coming up through the bed from inside surfaces. (*This is a tip given me by the MRA*). It is as well to protect the lower bed by means of paper, or a sheet of thin asbestos, that can be moved from bay to bay.

One has to be content with the knowledge that things do right themselves and the worst loss is that of time. But time is our enemy.

---

**Congratulations** to Mr. J. K. Knowles, General Secretary of the NFU, on his CBE; and to Sir James Turner, NFU President, on his honorary degree of Doctor of Laws (Leeds).

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# *My Favourite Recipes*

## 2.—Mrs. G. M. McArthur, *of Arbroath*

During the past 15 years I have experimented with many different methods of cooking mushrooms and, like the growers, I still feel that there is a great deal to be learned; but there is no doubt that mushrooms have won an ever-increasing popularity in the majority of households, both as a pleasurable addition to party dishes and to simple home cooking.

My own favourites are in the latter category, and none is original. I cannot remember where any of them originated, and no doubt they will have been altered a little here and there to suit the family's own particular tastes.

### *Sweetbreads and Mushrooms*

Lay sweetbreads in salt and water for 2 hours to extract blood. Wash well and put them into boiling water and boil gently for 10 minutes. Strain. When cold trim off fat and put into a pie dish with enough water to cover bottom of dish. Add several firm mushrooms, salt and pepper, and cook until all are tender (about 1 hour). Thicken with flour and milk to make a white sauce, adding a little butter if necessary. A brown sauce, if preferred, is equally good.

### *Mushroom au Gratin*

Chop up half-a-dozen medium sized mushrooms, a little bacon, and some parsley. Salt and pepper to taste and fry together in stewpan for a few minutes. Then add one beaten egg and stir till cooked. Fill some large, flat mushrooms with the mixture, cover with breadcrumbs and little pieces of butter. Put in a greased pie dish and brown in oven. When ready, pour over a brown sauce, slightly flavoured with onion.

*Tried Favourites Cookery Book*

### *Cold Savoury*

Fry ½ lb. mushrooms until golden brown. Drain on wire tray until cold, then chop into small pieces. Open some bridge rolls and toast the soft centre part. Butter, then cover with the chopped mushrooms, salt and pepper to taste. Garnish with parsley or cress. This makes a tasty cold savoury.

### *Mushroom Soup*

1 lb. mushrooms, 1 medium onion, ½ pt. milk, 1 quart stock,
2 yolks of eggs, 2 oz. butter, 2 oz. flour, pepper, salt.

Clean and chop mushrooms, using stalks if they are clean enough. Slice and chop onions also. Melt the butter and cook mushrooms and onions gently for 5 minutes, but do not fry them. Add the flour, blend well with mushrooms and onions. Add stock and bring to boil, stirring to prevent lumps forming. Add pepper and salt and simmer for 30 minutes. Rub through sieve, return to saucepan, mix yolks of eggs with milk and stir into soup. Cook slowly for about 4 minutes, but do not let soup reach boiling point otherwise eggs will curdle. Serve with toast or fried bread.

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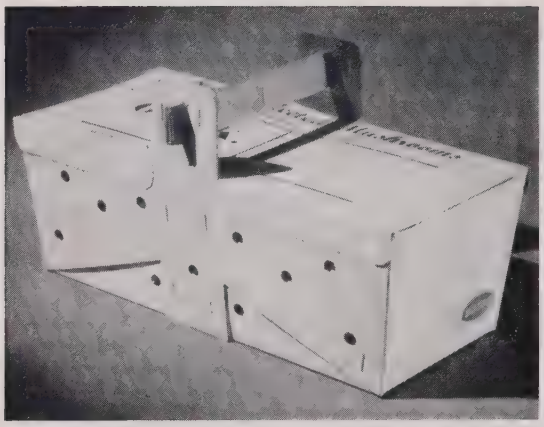

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G. M. McArthur sent us this Recipe for—

## *Mushroom Ketchup*

18 lb. Mushrooms or Stems.
14 oz. Salt.
1 oz. Whole Black Pepper.
1 oz. Whole White Pepper.
1 oz. Jamaica Pepper.
1 oz. Whole Cloves.
1 oz. Whole Ginger.
½ oz. Chillies.
¼ oz. Mace (if unobtainable, use Mustard Seed).

Soak stems in salt for 48 hours. Using very fine muslin, squeeze it to take all the moisture out. Strain the liquid through muslin again. Put other ingredients in a muslin bag and boil everything together for ½ hour. Let it cool and strain again.

# HARROGATE, 1953

The Mushroom Convention in Harrogate, on 29th and 30th September, promises to be the best the MGA has arranged so far, writes **Angus Watson.** The provisional programme is as follows:

*Tuesday, 29th September:*

9.30 a.m. Refresher Course at the Royal Hall.
11 a.m. Reception by the Chairman, and Annual Lunch at the Majestic Hotel.
3 p.m. Annual General Meeting at the Royal Hall.
5 p.m. Buffet tea.
8 p.m. Civic Reception and Party given by the Mayor at the Royal Baths.

*Wednesday, 30th September:*

10 a.m. to 10 p.m. Mushroom Industry Exhibition in the Royal Hall and Annexe.

The civic authorities have entered into the spirit of the occasion with zest and the official welcome is a real compliment to the MGA. The town has excellent facilities to amuse the visitor and is a good shopping centre. We intend to provide just what Members want –with theatre comfort thrown in. Arrangements have been made to provide refreshment at all times, and a licensed bar will stay open. As it is to be a two-day affair, the judging in the produce competitions will take place on the first day in fairness to long-distance travellers, and the entries displayed during the Exhibition.

The North promises to do the MGA proud.

**Mr. A. H. Pearce,** Chairman of the NFU Mutual Insurance Society, died suddenly on 16th November, in his 89th year. He has been succeeded by **Mr. S. R. Henson,** well-known Stratford-on-Avon farmer and son of Mr. James Henson, a founder-member of the Society.

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## A BEGINNER'S PRAYER

O, God of Fungi, arrogant, capricious,
For whom mycelium runs (and sometimes not),
As we are starting on a quite ambitious
And costly venture, that is why we thought
A little flattery would be judicious
Before you chose to put us on the spot.
Here are the essentials, Lord, in case you missed 'em:
Ten thousand footage, on the Two-Zone System.

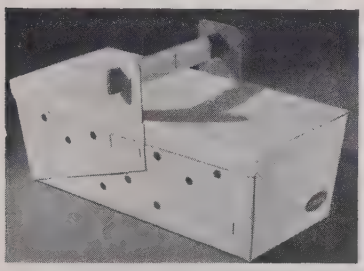
Dactylium, eelworm and mycogone,
And truffle (coming when the heat is torrid)
That fills with yellow brains the useless tray;
Springtails, sciara, cecid fly and phorid,
Which make the profits wither all away,
And other pale marauders quite as horrid;
The moulds, both white and brown, and Vert-de-gris—
Deliver us, good Lord, from all of these.

Maintain, at current rates, our muck supplies,
May chips and all accessories abound—
See that the coming Derby winner lies
On bedding not so strawy on the ground.
Our smokes, our sprays and dusts please supervise—
Speed back the days of seven bob a pound;
Prevent us, Sir, from ever trashing laxly,
But imitate the demi-gods at Yaxley.

Symbols, like ink-caps, grow on horse manure,
Wild permutations jostle on the chart;
Guide us through all this strange nomenclature
Which clogs increasingly the grower's art,
So that we can in confidence ensure
A consummation warming to the heart:
Three pounds per foot, three hundred to the ton,
With both or either, God, the battle's won!

A.R.R.

## SEEN THIS?



J. Dring Limited, the Portsmouth packaging firm, have now produced what they claim is the world's finest mushroom basket. And it is made of cardboard! Tests which have been carried out show that the objections to cardboard have been overcome by the simple expedient of impregnating it with wax, thus absolutely eliminating the possibility of moisture absorption.

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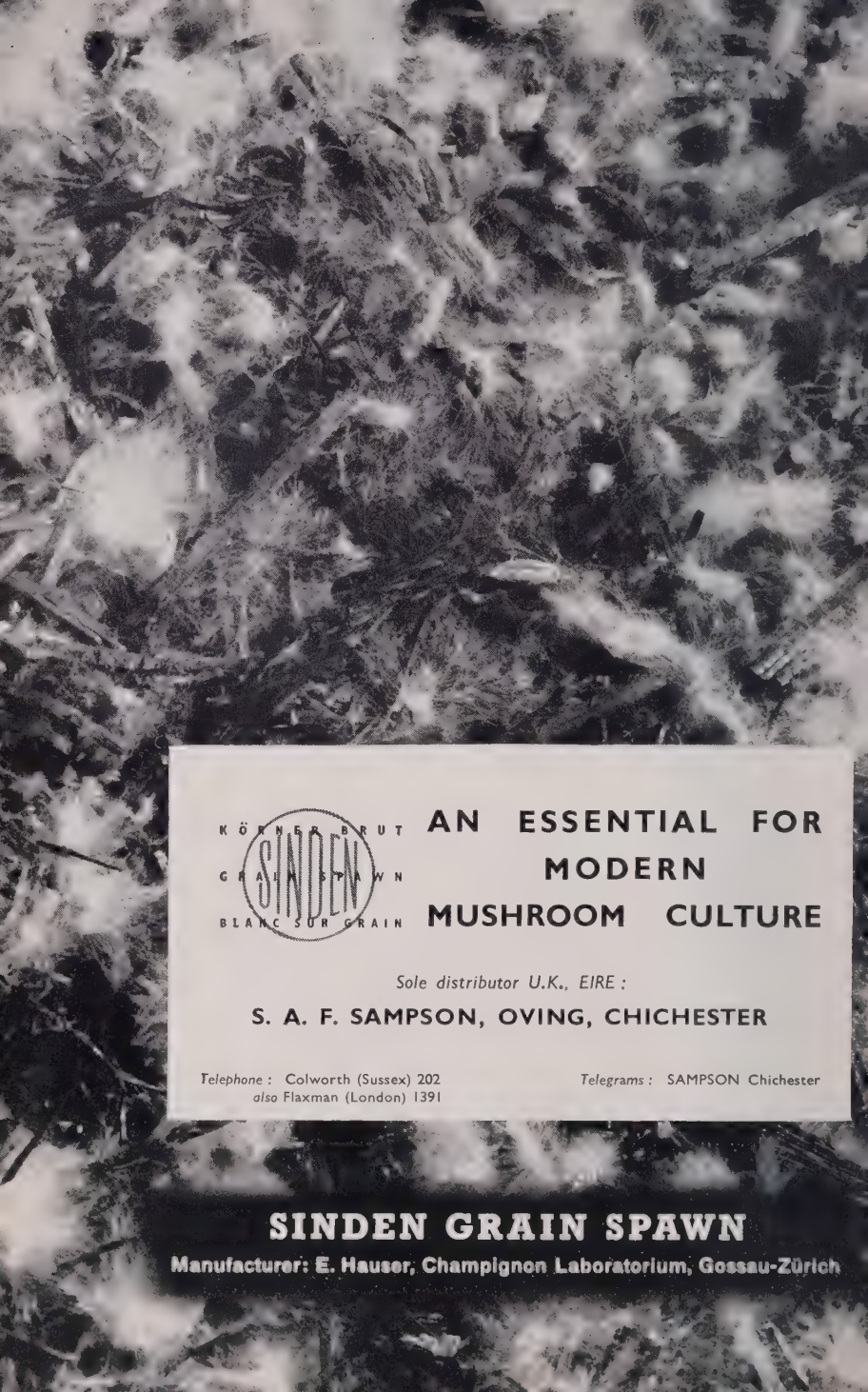
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# Stanley Middlebrook's Diary

**Dec. 10.** Mushrooms we are told are often " shocked " into life. I think I could provide evidence that such shocks should be very brief and that anything in the nature of a general cooling off, for instance, at this season might have serious repercussions. I'm thinking in terms of a boiler out of commission for a couple of days or perhaps a full day's electricity breakdown where pump circulation or automatic stokers are used. The shock should perhaps be sudden but *not* prolonged.

**Dec. 16.** Owing to the depredations of *Dactylium* where spawn "A" is planted (see various earlier notes) we are now having to turn such houses out at $5\frac{1}{2}$ weeks. But such is the vitality of this spawn that in those $5\frac{1}{2}$ weeks we have averaged over 2 lb. per sq. ft. Moreover the said vitality permits earlier casing and saves time. So if we can maintain recent averages and times we should get nearly $4\frac{1}{2}$ crops a year on shelves. We might even save compost as beds could perhaps be shallower for only $5\frac{1}{2}$ weeks cropping. How many tray growers are doing more than 4 crops a year? And incidentally *why* are they only doing four? Bad management somewhere, I suggest.
Look at some figures. Take 5 houses of 1,000 sq. ft. as a basis. Used as shelf houses you would have the following:

$$5 \times 1{,}000 \times 2 \text{ lb.} \times 4\tfrac{1}{2} \text{ crops} = 45{,}000 \text{ lb. per year.}$$

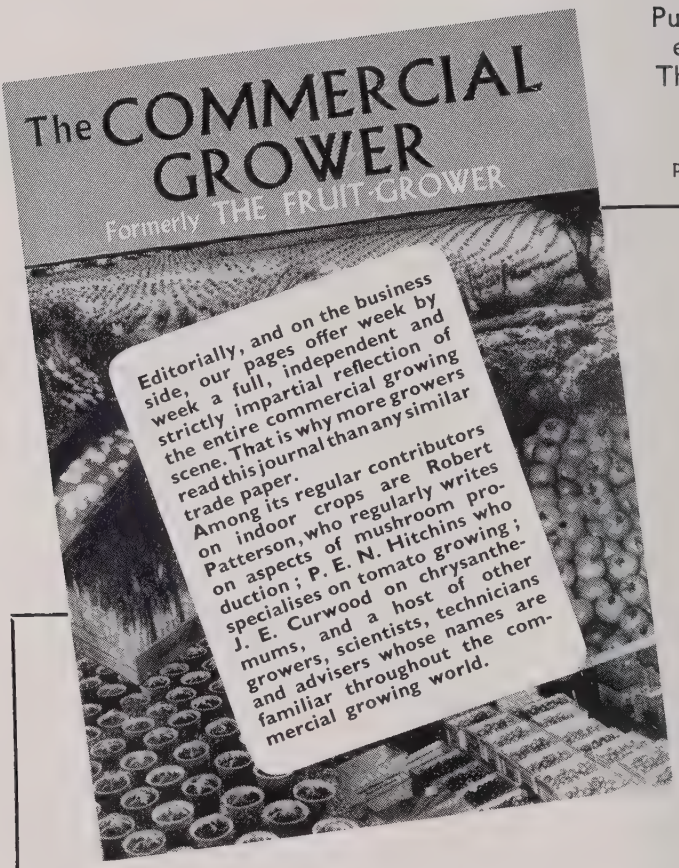
Now consider trays with the same 5 houses, only four of which are cropping:

$$4 \times 1{,}500 \times 1{\cdot}5 \text{ lb.} \times 4 \text{ crops} = 36{,}000 \text{ lb. per year.}$$

Come on, you tray men, you've got to show me something better than that for all your extra work, soil, compost, spawn, capital outlay, trays, maintenance, mechanical equipment, etc., etc. Go on! Argue that there is a snag somewhere. I know there is, and I leave you to find it out. At least the above figures make you think.

**Dec. 18.** If I were asked what is the most irritating job in the mushroom grower's year I would unhesitatingly answer—the steam boiler inspections. First it is difficult to arrange a date some weeks in advance when one can spare the boilers, and inevitably one predicts falsely. Three houses and 20 tons of soil need steaming on the " fixed " day, and the boiler is in bits and pieces. The inspector arrives, makes a casual examination, decides the boilers have had it and advises immediate dismantling and scrapping, is encouraged to change his view and persuaded to make a more detailed examination. He grudgingly admits they might go another year but must definitely be replaced then. He hammers, taps, climbs in, climbs out, grunts, complains, wishes he had a black-coated job, realises that he *has*, gives a disgruntled " Okay " and finally departs; leaving us with the bits and pieces to re-assemble and a vague feeling that nothing will prevent the boilers blowing themselves sky-high within a twelvemonth. It's been like that for years!

**Dec. 20.** Mr. Luxmoore describes in this issue a condition of split pinheads, " aping the bishop in chess " as he so aptly puts it, and rather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infers that it may be caused by creosote fumes. Pure bunkum, Mr. Luxmoore! Every now and then we get " bishops " but we never use creosote. I think inadequate ventilation at some stage after casing may be responsible, yet oddly enough we predict and usually have good crops when we get " bishops". We prefer them to pawns anyway —if Mr. Luxmoore would so describe undeveloping pinheads!

**Dec. 23.** Complained to the Railway Executive about the non-arrival of our turkey from one of the best mushroom-cum-turkey growers in the country.

**Dec. 26.** *Champions du plat*, offered as a savoury on a hotel menu, turned out to be fried mushrooms garnished with soot-coloured slime. Most appetising! Champion? *Mais non.*

**Dec. 27.** One of the men collected a large spawn box from the cold store and took it into a house ready for spawning. He dipped in his hand to bring out a carton of spawn, gave out a wild scream, hastily withdrew his hand and ran for his life. Our turkey had arrived! Now we know the make of spawn that produces for our turkey/mushroom farmer his big crops.

**Dec. 29.** Following up my statements here and elsewhere about the imperfections of some spawns I report that I have just heard from a grower who has done some extensive comparative tests on two spawns. He's been troubled with a lot of truffle this last year and states that it has been confined almost exclusively to one of the two spawns, the other being virtually clear of all trouble. Evidently a few people are beginning to make some critical exploratory excursions into this hitherto forbidden and exempted territory.

**Jan. 3.** I don't like the look of my price charts. Last year at this time we were averaging 4/3d. nett and the chart fell steadily to about the middle of July when at a figure of about 3/- it started to rise again. Against last year's 4/3d. in early January we are now at around 3/3d. If there is a similar steady fall this year we shall be selling at under cost by July. It's poor consolation, but the only bright spot seems to be a very slight increase in the demand for spent compost. Will the whole mushroom story end up with the tail wagging the dog?

**Jan. 5.** We've sprung a major water leak, either in the main or in the distribution lines. We don't know where, and we don't know how to find it. The leak is at the rate of about 300 gallons per hour with all the taps turned off—equal to a $\frac{1}{2}$" hose running open-ended all the time. In our search for cleanliness we have contrived to cover most of the water pipes with concrete, and have thereby given ourselves a pretty problem to solve.

**Jan. 6.** The other day I had occasion to write to Mr. Atkins on the subject of trays and because a typewriter was not available resorted to my execrable penmanship, adding a note that he should have the letter typed in his office. I concluded my observations with this appropriate phrase, " If it's ease of mind you want, eschew trays." He passed the letter to be typed and that phrase was transcribed to " If it's ease of wind you want, chew trays."

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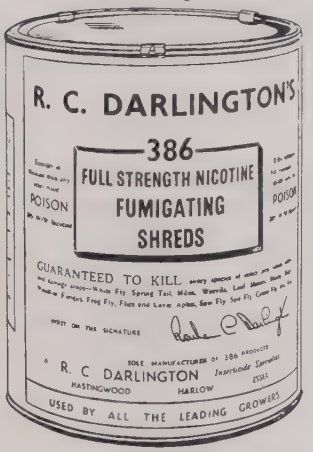


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**POLYACK SOIL CONDITIONER, U.S.A. PRODUCT**
Converts hard clay soil into workable soil.
"WILL EASE THE CASING SOIL PROBLEMS"

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# DEDETANE 10% DDT DUST

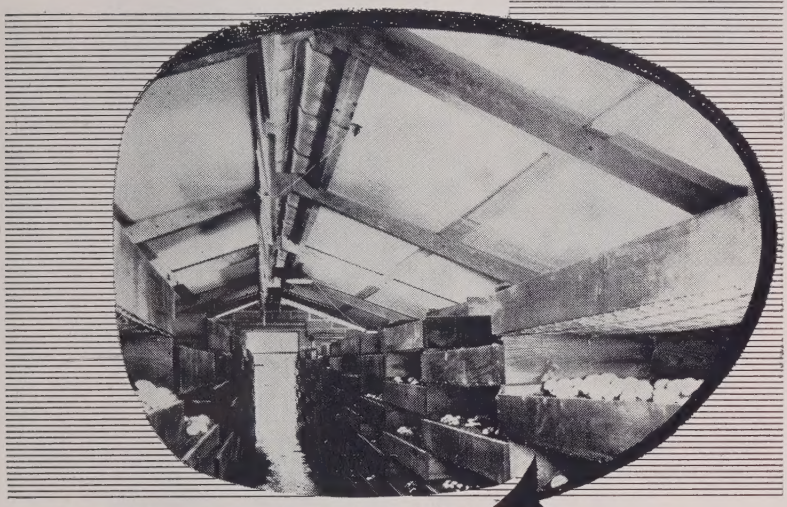
Contains 10 per cent. DDT in a light, inert base. Use on Mushrooms every fortnight at 2 lb. per 1,000 square feet to control Mushroom Fly. It is also effective against Woodlice.

14 lb. **19/-** ; 28 lb. **36/-** ; 56 lb. **67/-** ;
1 cwt. **£4** ; 5 cwt. **£18 5s. 0d.** ; 10 cwt. **£36**

*Specially prepared for the Mushroom Grower by*

**THE MURPHY CHEMICAL COMPANY LTD.**
WHEATHAMPSTEAD HERTFORDSHIRE

# *Lined with*



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**'ASBESTOLUX'** is an incombustible, inorganic, insulation board. It is unaffected structurally by the absorption of water and withstands continual steaming. It is very light, immune from attack by termite or mould and has a very high resistance to acids. The photograph shows one of the houses at Dr. Rooke's Alton farm lined with ASBESTOLUX. *Contractors :* Geo. W. King Ltd.

**'ASBESTOLUX'** will withstand a cycle of steaming for, say 36 hours at 120°F.– 140°F. followed by fumigating with formaldehyde for 24 hrs. Because of its light weight, no strengthening of normal shed structure is required, and it is very easy to work and fit. It is the perfect lining for mushroom houses.

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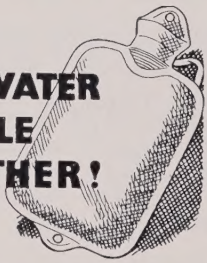

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**When there's frost about you do not hesitate to look after your own comforts. During "hot water bottle" weather every care should be taken to see that vehicles and machinery are adequately protected from frost. Empty radiators and make sure.**

• *Assets exceed £9,000,000*

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**HARROGATE 1953**

*Mushroom Growers' Association A G M and Refresher Course*
*TUESDAY, 29th SEPT.*

*

MUSHROOM INDUSTRY
**EXHIBITION**
*Wednesday, 30th Sept.*

*

**FOR DETAILS SEE PAGE 49**

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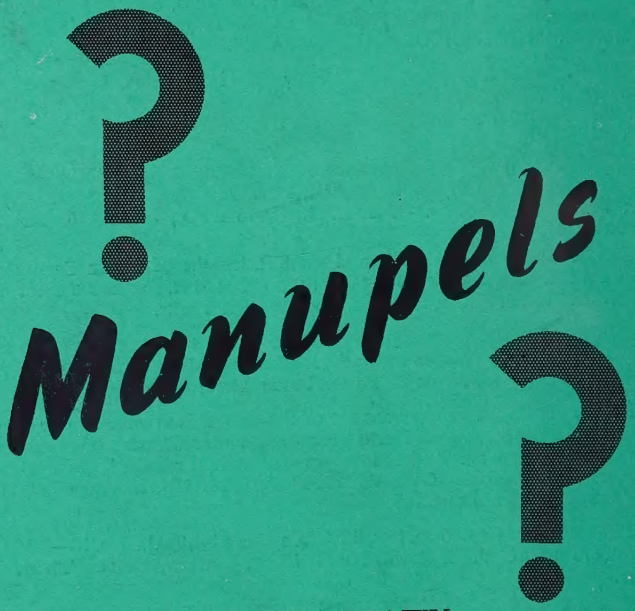


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